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# United States Patent [19]

Streit

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## [54] NEURAL NETWORK ARCHITECTURE FOR NON-GAUSSIAN COMPONENTS OF A MIXTURE DENSITY FUNCTION

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[58] Field of Search ..... 395/20-27; 382/155-159

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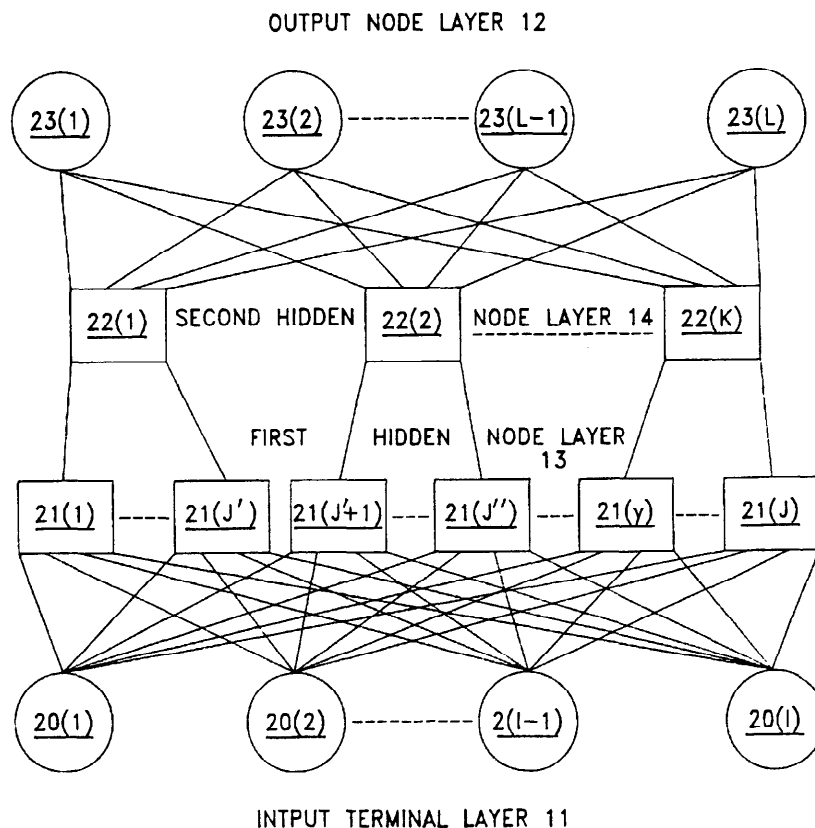
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### [57] ABSTRACT

A neural network for classifying input vectors to an outcome

class, under the assumption that the outcome classes are characterized by mixtures of component populations, with each component population having a multivariate non-Gaussian likelihood distribution. The neural network comprising an input layer for receiving the components of the input vector, two hidden layers for generating an number of outcome class component values, and an output layer that identifies an outcome class in response to the outcome class component values. The first hidden layer includes a number of first layer nodes each connected receive input vector components from the input layer and generating in response a first layer output value representing a selected first layer power of the absolute value of the sum of the difference between a function of each input vector component and a threshold value. The second hidden layer includes a plurality of second layer nodes each being connected to predetermined ones of the first layer nodes and generating in response to the first layer output values an outcome class component value representing a function related to the exponential of the negative square of the sum of first layer output values. The output layer includes a plurality of output layer nodes each associated with an outcome class. Each output layer node receives the output class component values from all of the second layer nodes and uses them, in combination with respective weighting values, to generate a value that represents the likelihood that the input vector is properly classified to the output layer node's outcome class.

9 Claims, 1 Drawing Sheet



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